

Listing of Claims:

1. (Currently Amended) X-ray examination apparatus for acquiring X-ray image data of a region of interest, comprising:

an imaging unit ~~(1-3)~~ comprising an X-ray source ~~(2)~~ for emitting X-ray radiation and an X-ray detector ~~(3)~~ for detecting X-ray radiation after penetration of said region of interest,

a processing ~~device~~ means ~~(22)~~ for determining a desired position of said imaging unit, at which X-ray image data shall be acquired, based on a predetermined image acquisition plan ~~(P)~~ and/or an actual position ~~(D)~~ of an instrument ~~(11)~~, the predetermined image acquisition plan being associated with optimal viewing directions,

a tracking device for tracking the actual position of said instrument and said imaging unit,

a control ~~device~~ means ~~(23)~~ for determining position parameters of said imaging unit ~~(1-3)~~ for said desired position, and

a positioning ~~device~~ means ~~(30)~~ for positioning said imaging unit ~~(1-3)~~ at said desired position by use of said position parameters.

2. (Currently Amended) X-ray examination apparatus as claimed in claim 1, wherein said positioning ~~means~~ device ~~(30)~~ comprises an automatic position control ~~means~~ device for automatically positioning said imaging unit ~~(1-3)~~ at said desired position.

3. (Currently Amended) X-ray examination apparatus as claimed in claim 1, wherein said positioning ~~means~~ device ~~(30)~~ comprises a manual position control ~~means~~ device ~~(31)~~ for manually positioning said imaging unit ~~(1-3)~~ at said desired position, a position check ~~means~~ device ~~(32)~~ for checking if the desired position has been reached, and a signaling ~~means~~ device ~~(33)~~ for signaling if the desired position has been reached and/or how a path to reach the desired position can be reached, and a tracking ~~(12)~~ means for tracking the actual position of said imaging unit ~~(1-3)~~.

4. (Currently Amended) X-ray examination apparatus as claimed in claim 1, further comprising ~~tracking means (12, 13) for tracking the actual position of said instrument (11) and said imaging unit (1-3), wherein said control means~~device (23) are is operative for determining said position parameters by use of the tracked position (D) of said instrument (11) and wherein said position device moves said image device to said desired position in temporal proximity to said instrument being moved.

5. (Currently Amended) X-ray examination apparatus as claimed in claim 1, wherein said predetermined image acquisition plan (P) is determined based on image data ~~(I) of said region of interest, wherein particular based~~said image data is on-pre-acquired 3D image data.

6. (Currently Amended) X-ray examination apparatus as claimed in claim 1, wherein said processing ~~means~~device (22) comprise a calibration means~~device~~ for calibrating said imaging unit (1-3) with said predetermined image acquisition plan and/or said instrument (11).

7. (Currently Amended) X-ray examination apparatus as claimed in claim 1, wherein said imaging unit ~~(1-3)~~ further comprises a C-arm on which said X-ray source ~~(2)~~ and said X-ray detector ~~(3)~~ mounted.

8. (Currently Amended) X-ray examination apparatus as claimed in claim 1, wherein said desired position determines a desired plane or projection to be visualized, ~~in particular with respect to said instrument (11) or with respect to pre-acquired 3D image data.~~

9. (Currently Amended) A method of X-ray examination method for acquiring X-ray image data of a region of interest by use of an imaging unit (1-3) comprising an X-ray source (2) for emitting X-ray radiation and an X-ray detector (3) for detecting X-ray radiation after penetration of said region of interest, comprising the steps of:

determining a desired position of said imaging unit (1-3), at which X-ray image data shall be acquired, based on a predetermined image acquisition plan and/or an actual position of an instrument (11),

tracking the actual position of the instrument and the imaging unit using a tracking device,

determining position parameters of said imaging unit (1-3) for said desired position,

positioning said imaging unit (1-3) at said desired position by use of said position parameters, and

acquiring X-ray image data of said region of interest at said desired position.

10. (New) The method of claim 9, further comprising calibrating said imaging unit with said predetermined image acquisition plan and said instrument.

11. (New) The method of claim 9, further comprising manually positioning the imaging unit at the desired position.

12. (New) The method of claim 11, further comprising:
determining if the desired position has been reached, and
signaling if the desired position has been reached.

13. (New) The method of claim 9, further comprising providing information representative of how the desired position can be reached.

14. (New) The method of claim 9, further comprising generating the predetermined image acquisition plan based on pre-acquired three dimensional data and synthetic projections.
15. (New) X-ray examination apparatus for acquiring X-ray image data of a region of interest, comprising:
- an imaging unit comprising an X-ray source for emitting X-ray radiation and an X-ray detector for detecting X-ray radiation after penetration of said region of interest,
 - a processing device for determining a desired position of said imaging unit, at which X-ray image data shall be acquired, based on a predetermined image acquisition plan and an actual position of an instrument,
 - a tracking device for tracking the actual position of said instrument,
 - a control device for determining position parameters of said imaging unit for said desired position, and
 - a positioning device for positioning said imaging unit at said desired position by use of said position parameters, wherein said positioning device comprises a manual position control device for manually positioning said imaging unit at said desired position.
16. (New) The apparatus of claim 15, further comprising:
- a position check device for checking if the desired position has been reached, and
 - a signaling device for signaling if the desired position has been reached.
17. (New) The apparatus of claim 15, further comprising a calibrating device for calibrating said imaging unit with said predetermined image acquisition plan and said instrument, wherein said position device moves said image device to said desired position in temporal proximity to said instrument being moved.
18. (New) The apparatus of claim 15, wherein the signaling device provides information representative of how the desired position can be reached.

19. (New) The apparatus of claim 15, wherein the predetermined image acquisition plan is generated based on pre-acquired three dimensional data and synthetic projections.

20. (New) The apparatus of claim 1, wherein the predetermined image acquisition plan is generated based on pre-acquired three dimensional data and synthetic projections.